

AMENDMENTS TO THE CLAIMS

Please amend the claims of the instant application as follows:

Claims 1-20 (cancelled).

Claim 21: Apparatus for detecting a fire in a scene by infrared radiation image processing, said apparatus comprising:

- means for receiving a sequential plurality of infrared radiation images of the scene;
- means for generating each said image an array of picture elements (pixels);
- means for determining each pixel a value that is representative of the pixel's portion of infrared radiation intensity in the array of the scene image;
- means for determining a threshold value from the values of the pixels of at least one image;
- means for identifying a region of at least one pixel in one image of the plurality of images of the scene by comparing the values of the pixels of the one image to the determined threshold value;
- means for tracking said region through images of the plurality subsequent said one image to determine a change of said region that meets predetermined infrared radiation criteria; and
- means for detecting the fire in the scene based on the determined change of said region.

Claim 22 (new): The apparatus of claim 21 including means for assigning pixels having values above the threshold value and in close proximity to each other in the one image array to the region.

Claim 23 (new): The apparatus of claim 21 wherein the means for determining a threshold value includes: means for calculating a mean value of the pixel values of the one image; and means for determining the threshold value based on the calculated mean value.

Claim 24 (new): The apparatus of claim 21 wherein the means for determining a threshold value includes: means for calculating a standard deviation value of the pixel values of the one image; and means for determining the threshold value based on the calculated standard deviation value.

Claim 25 (new): The apparatus of claim 21 wherein the means for tracking includes:
means for identifying the region in images of the plurality subsequent the one image; and
means for comparing the identified regions of the one and subsequent images to
determine a change of the region that meets the predetermined infrared radiation criteria.

Claim 26 (new): The apparatus of claim 25 wherein the means for comparing includes means for
comparing the identified regions of the one and subsequent images to determine the change of
the region that meets the predetermined infrared radiation criteria based on the average pixel
values of the region.

Claim 27 (new): The apparatus of claim 25 wherein the means for comparing includes means for
comparing the identified regions of the one and subsequent images to determine the change of
the region that meets the predetermined infrared radiation criteria based on the number of pixel
values in the region that are above a high intensity value.

Claim 28 (new): The apparatus of claim 25 wherein the means for comparing includes means for
comparing the identified regions of the one and subsequent images to determine the change of
the region that meets the predetermined infrared radiation criteria based on a location of the
centroid of the region within the image scene.

Claim 29 (new): The apparatus of claim 25 wherein the one and subsequent images are separated
from each other by a predetermined period of time.

Claim 30 (new): The apparatus of claim 25 wherein the one and subsequent images are separated
from each other by a predetermined number of sequential images of the plurality.

Claim 31 (new): The apparatus of claim 21 including means for locating the fire in the scene
based on the location of the region with the determined change in the scene.

Claim 32 (new): The apparatus of claim 21 wherein the means for detecting the fire includes:

means for identifying the region in sequential images of a predetermined period of time subsequent the one image;

means for comparing the identified regions of the one and sequential images to determine motion changes of the region;

means for calculating a motion value of the region based on said determined motion changes thereof; and

means for determining fire of a certain type based on the motion value of the region.

Claim 33 (new): The apparatus of claim 32 including means for determining a flaming fire if the motion value exceeds a predetermined threshold motion value.

Claim 34 (new): The apparatus of claim 32 including means for determining a smoldering fire if the motion value is below a predetermined threshold motion value.

Claim 35 (new): The apparatus of claim 32 including means for issuing an alarm based on the type of fire determined.

Claim 36 (new): The apparatus of claim 21 including means for displaying the sequential plurality of infrared radiation images on a grey scale video monitor.

Claim 37 (new): The apparatus of claim 21 including:

means for identifying a plurality of regions of at least one pixel in one image of the plurality of images of the scene based on pixel values;

means for tracking each region of said plurality through images of the plurality subsequent said one image to determine at least one region of the plurality having a change that meets predetermined infrared radiation criteria; and

means for detecting the fire in the scene based on the at least one region having the determined change.

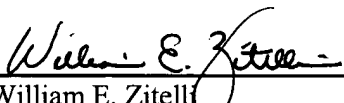
Claim 38 (new): The apparatus of claim 37 including means for locating fires in the scene based on the locations of the regions with the determined change in the scene.

Claim 39 (new): The apparatus of claim 37 wherein the means for detecting the fire includes:

means for calculating a motion value for each region, said motion value being calculated based on motion changes of the corresponding region through a predetermined number of sequential images subsequent the one image; and

means for determining fire of a certain type for each region having the detected change based on the motion value of the region.

Respectfully submitted,



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